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Reply to Lundberg, Larsen, and Weitzberg

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TO THE EDITOR: The letter of Lundberg et al. (12) does not relate directly to any of the articles we published in this journal (1, 2, 6). Rather, the correspondents make a general point on the potential risks to athletes who might choose to supplement their diet with nitrate or (especially) nitrite salts with the purpose of reducing the O₂ cost of exercise and enhancing exercise tolerance. This is an important point that we, of course, agree with.

We wish to stress that, unlike other research groups that have used sodium nitrate to investigate the physiological role of the nitrate-nitrite-nitric oxide (NO) pathway both at rest and during exercise (e.g., 7–10), in all of our recent studies we have used a nitrate-rich vegetable (beetroot) juice product to elevate plasma [nitrite] and potentially increase NO bioavailability (1, 2, 6, 13). We agree with Lundberg et al. that “with natural sources of nitrate such as whole vegetables or vegetable juices, we do not foresee any acute risks.” Indeed, we deliberately chose this “natural” supplementation regimen because of strict regulation of nitrate salts in the UK and the possible health risks associated with consuming them. As we pointed out previously (3), nitrate-rich whole vegetables or vegetable juices also contain antioxidants and polyphenols that may act to limit the formation of potentially harmful nitrogenous compounds. We agree with others (4, 11, 14) that the health benefits of increased fruit and vegetable consumption may be consequent, at least in part, to a commensurate increase in nitrate intake.

In summary, we have not advocated the uncontrolled use of nitrate or nitrite salts by athletic or other human populations in articles published in this journal (1, 2, 6) or elsewhere (14), and nor would we do so. Lundberg et al. are right to draw readers' attention to the potential hazards of this practice. Dietary supplementation with nitrate-rich vegetable products, however, appears to afford several possible benefits to human health and performance, including, but not limited to, a reduction in resting blood pressure, a lowering of the whole body O₂ cost of physical activity, and increased exercise tolerance (1, 2, 5–11, 13, 14). Clearly, as with other nutritional supplements, we must remain alert to the risk/benefit quotient when studying the effects of nitrate ingestion on human physiology.

DISCLOSURES

No conflicts of interest, financial or otherwise, are declared by the authors.

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